MUHAMMAD UZAIR YOUSUF

Department of Mechanical Engineering
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SUMMARY

➢ Creative researcher passionate about energy systems, renewable energy, and interdisciplinary collaboration. Expertise in resource modelling, assessment, and optimization. Excellent analytical skills that support both theoretical and applied energy research.

EDUCATION

➢ **Doctor of Philosophy (Ph.D.)**
Department of Mechanical & Electrical Engineering, Massey University, Palmerston North, New Zealand, 2022
Thesis: Enhancing statistical wind speed forecasting models

➢ **Master of Engineering (M.E.)**
Department of Mechanical Engineering, NED University of Engineering & Technology, Karachi, Pakistan, 2016
Thesis: Solar Energy Potential Estimation for Open Plains and Roof top areas using Irradiance Probability Distribution
CGPA: 4.00/4.00

➢ **Bachelor of Engineering (B.E.)**
Department of Mechanical Engineering, NED University of Engineering & Technology, Karachi, Pakistan, 2013

ACADEMIC EXPERIENCE

➢ **Assistant Professor** (Jul. 2022 – Present)
Department of Mechanical Engineering, NED University of Engineering & Technology, Pakistan
➢ **Lecturer** (Oct. 2015 – Jul. 2022)
Department of Mechanical Engineering, NED University of Engineering & Technology, Pakistan
➢ **Lab Engineer** (Dec. 2014 – Oct. 2015)
Department of Mechanical Engineering, NED University of Engineering & Technology, Pakistan
➢ **Part Time Teacher** (Jul. 2014 – Dec. 2014)
Department of Mechanical Engineering, NED University of Engineering & Technology, Pakistan

ACADEMIC SERVICE

➢ **Reviewer** for research papers in various journals including (i) Sustainable Energy Technologies and Assessments (Elsevier) (ii) Journal of Cleaner Production (Elsevier) (iii) Expert Systems with Applications (Elsevier) (iv) IEEE Access (IEEE) (v) Environmental Progress and Sustainable Energy (Wiley) (vi) Energy & Environment (SAGE) (vii) Applied Solar Energy (Springer) (viii) International Journal of Sustainable Energy (Taylor and Francis) (ix) Sustainability (MDPI) (x) Atmosphere (MDPI) (xi) International Journal of Environmental Research and Public Health (MDPI) (xii) Jordan Journal of Physics (xiii) GMSARN International (xiv) Energy Sources, Part A: Recovery, Utilization, and Environmental Effects (Taylor and Francis) (xv) NED University Journal of Research (xvi) Theoretical and Applied Climatology (Springer)

➢ **Member** of technical review committee in 13th International Mechanical Engineering Congress under the theme "Industry 4.0 and Allied Digital Trends – Current Perspective and Future Direction" held on 6th-7th March 2024

➢ **Member** of technical review committee in 12th International Mechanical Engineering Congress under the theme "Role of Mechanical Engineering in Economic Uplift and Sustainability" held on 10th-11th May 2023

➢ **Member** of organizing committee in 8th International Mechanical Engineering Congress under the theme "Emerging Technologies & Industrial Applications" held on 26th-27th Jan. 2018

- ➢ **Member** of organizing committee in 7th International Mechanical Engineering Congress under the theme "Recent Developments in Design, Energy and Alternate Fuels" held on 24th-25th Mar. 2017
- ➢ **Member** of organizing committee in 6th International Mechanical Engineering Congress under the theme "Green Systems and Innovations" held on 15th-16th Jul. 2016

OTHER OFFICIAL ASSIGNMENTS
- ➢ **Lab In-charge**, Renewable Energy Research Centre (2024- Present)
- ➢ **Lab In-charge**, Internal Combustion Engines Laboratory (2023- Present)
- ➢ **Member DOBEC,** Department of Mechanical Engineering (2022- Present)
- ➢ **OBE Coordinator,** Department of Mechanical Engineering (2018-2019)
- ➢ **Co-operative Member**, Vehicle Inspection Team, Sindh Police (2017)
- ➢ **Lab In-charge**, Thermodynamics Laboratory (2015-2018)

PROJECTS
Funded Projects
- ➢ Grant of USD 5,000 (equivalent PKR 1.38 million) received by **ASHRAE USA** for the Project "Development of a compact off-grid solar-powered refrigeration system for storing essential medicines and vaccines for remote clinics" (as PI) in 2024-2025
- ➢ Grant of PKR 85,000 received by **NED Alumni Association of South California, USA** for the Final Year Design Project Solar-powered refrigeration system (as PI) in 2023-2024
- ➢ Grant of PKR 3.619 million received by **Ministry of Science and Technology (MoST) Endowment Fund** for the Industrial Research Project "Development of an AI-Enabled Low-Cost PM2.5 Monitoring System for Combustion Emissions" (as co-PI) in 2024
- ➢ Grant of PKR 3.0 million received by **Ministry of Science and Technology (MoST) Endowment Fund** and **NED University** for the PhD project "Deep Learning based Spatio-Temporal Wind Power Forecasting" (as co-supervisor) in 2023
- ➢ Grant of NZD 4,120 received by **Tararua Wind Farm** for the PhD Project "Enhancing statistical wind speed forecasting models" (as PhD scholar) in 2021
- ➢ Grant of NZD 4,100 received by **Tararua Wind Farm** for the PhD Project "Enhancing statistical wind speed forecasting models" (as PhD scholar) in 2020

SUPERVISION
Ph.D. Thesis Co-Supervision
- ➢ Deep Learning based Spatio-Temporal Wind Power Forecasting (Syed Muhammad Rashid Hussain)
M.E. Thesis Supervision
- ➢ Feasibility of Agrivoltaics Systems (Farhad Ghaffar, 2023 – 2024)
- ➢ An improved grey forecasting model to predict wind speed based on small sample dataset (Arslan Ahmed, 2023 – 2024)
- ➢ Evaluating the effect of air pollution on daily global solar radiation prediction (Abid Ali, 2023 – 2024)
- ➢ Techno-economic feasibility of implementing solar photovoltaic power plant at airport (Hafiz Muhammad Usaid Saleem, 2022 – 2023)
- ➢ Energy, Exergy, Economic and Environmental (4E) analysis of wind farms in Pakistan (Muhammad Kashif, 2021 – 2022)
- ➢ Life cycle assessment of a coal fired power plant (Munesh Kumar, 2021 – 2022)
- ➢ Investigation of energy management practices in steel industry (Muhammad Anus, 2021 – 2022)
- ➢ Fine particulate matter forecasting models: a case study for major cities of Pakistan (Syed Muhammad Shujaat Ali, 2021 – 2022)
M.E. Thesis Co-Supervision
- ➢ Feasibility benefits & challenges of GREB & its comparison with green building (Muhammad Adnan Javed, 2024 – 2025)
- ➢ Short term forecasting of PM 2.5 in different cities of Pakistan using hybrid algorithm (Rafay Malik, 2020 – 2021)
- ➢ Production planning modelling and forecasting using statistical techniques (Muhammad Usman, 2020 – 2021)
- ➢ Probabilistic assessment of exergy analysis for wind turbines (Muhammad Kashan Rashid, 2019 – 2020)

➢ Auto Regressive Integrated Moving Average (ARIMA) modeling for wind energy potential of Pakistan (Muhammad Bilal Ashraf, 2019 – 2020)

AWARDS AND HONORS

➢ **Best Published Research Award** from NED Alumni Association of South California, USA (2022)
➢ Chairman IEP Medal for **Best Paper** in 11th International Mechanical Engineering Conference (2022)
➢ **Best Researcher Award** from NED University of Engineering & Technology (2022)
➢ HEC **Scholarship** to pursue Ph.D. under the program "HRD Initiative-MS Leading to Ph.D. Program of Faculty Development for UESTPs/UETs Phase-I" (2019 – 2022)
➢ **Best Teacher Award** under lecturer category from NED Alumni Association of South California, USA (2018)
➢ **Best Published Research Award** from NED Alumni Association of South California, USA (2018)
➢ Cumulative GPA of **4.00/4.00** throughout the Master of Engineering at Mechanical Engineering Department (2014 – 2016)
➢ **Very Good and Excellent** Student Feedback Ratings in all undergraduate and postgraduate courses (2014 – till present)

TEACHING

Undergraduate	Masters	PhD
• Thermodynamics	• Time Series Analysis and Forecasting	• Energy Forecasting
• Internal Combustion Engines	• Energy Modelling & Forecasting	• Wind Energy
• Computer Programming and Applications	• Wind Energy: Design and Integration	
• Fundamentals of Thermal Fluid Engineering	• Design of Wind Turbines	

TRAININGS/ WORKSHOP/ CONFERENCES

➢ Attended training on **Technology Transformation Dissemination Sessions** organized by Erasmus+ CBHE Project: Getinnovative4impact, 6th-11th December 2024
➢ Conducted session for final year students on **Understanding Research Papers: Structure, Classification, Literature Review, and Effective Reading**, 5th September 2024
➢ Attended training on **How to Write Effective Project Proposals** organized by Quality Enhancement Cell, NED University, 15th November 2022
➢ Attended **17th World Wind Energy Conference & Expo**, 28th-29th November 2018
➢ Conducted various sessions on **OBE System** at departmental level, 2018 to date
➢ Attended 2-days training workshop on **Solar Mapping and Resource Assessment** organized by the World Bank Group and Alternate Energy Development Board Pakistan, 8th-9th March 2017
➢ Attended 3-days training on **Technical Computing with MATLAB** organized by Quality Enhancement Cell, NED University, 8th-10th December 2014

PROFESSIONAL MEMBERSHIPS

➢ Pakistan Engineering Council (PEC)
➢ Institute of Engineers Pakistan (IEP)
➢ Society of Chemical Industry (SCI)

PUBLICATIONS

Peer-reviewed Journal Articles

1. **Yousuf, M. U.,** Siddiqui, M. A., Kumar, M., & Umair, M. (2025). Life cycle assessment of lignite-fueled ultra-supercritical coal-fired power plant with evaluation of solar energy integration. Fuel, 385, 134079. DOI: 10.1016/j.fuel.2024.134079
2. Siddiqui, M. A., Baig, M. H., & **Yousuf, M. U.** (2024). Performance and data acquisition from low-cost air quality sensors: a comprehensive review. Air Quality, Atmosphere & Health, 1-21. DOI: 10.1007/s11869-024-01683-3
3. Umair, M., **Yousuf, M. U.,** Cheema, A. R., & Ul-Haq, J. (2024). Assessing the environmental consequences of fossil fuel consumption in newly industrialized countries. International Journal of Energy Sector Management. DOI: 10.1108/IJESM-08-2024-0036

4. **Yousuf, M. U.**, & Hussain, S. M. R. (2024). Performance evaluation of independent global solar radiation estimation models for different climatic zones: A case study. Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, 1-17. DOI: [10.1080/15567036.2021.1958955](10.1080/15567036.2021.1958955)

5. **Yousuf, M. U**., Malik, M. H., & Umair, M. (2024). 4E Analysis of Hybrid Solar-Wind Power Plants in Southern Pakistan: Energy, Exergy, Economic, and Environmental Perspectives. Science and Technology for Energy Transition. DOI: 10.2516/stet/2024088

6. **Yousuf, M. U.**, Irshad, M. A., & Umair, M. (2024). Identifying barriers and drivers for energy efficiency in steel and iron industries of Karachi, Pakistan: Insights from executives and professionals. Energy Nexus, 14, 100284. DOI: 10.1016/j.nexus.2024.100284

7. **Yousuf, M. U**., Saleem, M. U., & Umair, M. (2024). Evaluating the 7E impact of solar photovoltaic power plants at airports: a case study. Science and Technology for Energy Transition, 79, 19. DOI: 10.2516/stet/2024007

8. Ali, S. W., Rashid, M. M., **Yousuf, M. U.**, Shams, S., Asif, M., Rehan, M., & Ujjan, I. D. (2024). Towards the Development of the Clinical Decision Support System for the Identification of Respiration Diseases via Lung Sound Classification Using 1D-CNN. Sensors, 24(21), 6887. DOI: [10.3390/s24216887](10.3390/s24216887)

9. **Yousuf, M. U.,** Umair, M., Rehan, M., & Umrani, Z. A. (2024). Effect of adjusting orientation for solar energy applications in multiple climatic zones. Mehran University Research Journal of Engineering & Technology, 43(1), 70-81. DOI: 10.22581/muet1982.2401.2587

10. Nauman, M. M., Mehdi, M., **Yousuf, M. U**., Abid, M., Zaini, J., Esa, Z., & Iqbal, A. (2024). "Pressure Drop in Vertical Turbulent Bubbly Flows: A Theoretical Modelling Approach." ASEAN Engineering Journal, 14(2), 77-82. DOI: [10.11113/aej.v14.20701](10.11113/aej.v14.20701)

11. Umair, M., **Yousuf, M. U.,** Haq, J., Hussain, Z., & Visas, H. "Revisiting the environmental impact of renewable energy, non-renewable energy, remittances, and economic growth: CO_2 emissions versus ecological footprint for top remittance-receiving countries" Environmental Science and Pollution Research, 30(23), 63565-63579. DOI: [10.1007/s11356-023-26812-w](10.1007/s11356-023-26812-w)

12. Umair, M. & **Yousuf, M. U.** (2023). Evaluating the symmetric and asymmetric effects of fossil fuel energy consumption and international capital flows on environmental sustainability: A case of South Asia. Environmental Science and Pollution Research, 30, 33992 – 34008. DOI: [10.1007/s11356-022-24607-z](10.1007/s11356-022-24607-z)

13. Rehan, M., Yeo, A. G., **Yousuf, M. U.** & Avci, E. (2022). Anchoring Mechanism for Capsule Endoscope: Mechanical Design, Fabrication and Experimental Evaluation. Micromachines, 13(12), 2045. DOI: [10.3390/mi13122045](10.3390/mi13122045)

14. **Yousuf, M. U.**, Abbasi, M. A., Kashif, M., & Umair, M. (2022). Energy, exergy, economic, environmental, energoeconomic, exergoeconomic, and enviroeconomic (7E) analyses of wind farms: a case study of Pakistan. Environmental Science and Pollution Research, 29, 67301–67324. DOI: [10.1007/s11356-022-20576-5](10.1007/s11356-022-20576-5)

15. **Yousuf, M. U.**, Al-Bahadly, I., & Avci, E. (2022). Statistical wind speed forecasting models for small sample datasets: Problems, Improvements, and prospects. Energy Conversion and Management, 261, 115658. DOI: 10.1016/j.enconman.2022.115658

16. Uzair, M., Naqvi, A. A., & **Yousuf, M. U**. (2022). Numerical investigation to determine the optimal tilt angle of single slope solar still during summer season. TECCIENCIA, 17(32), 29-39. DOI: 10.18180/tecciencia.2022.32.3

17. Uzair, M., Kazmi, S. U. H., **Yousuf, M. U**., & Zaidi, S. A. A. (2022). Optimized performance of PV panels and site selection for a solar park in Pakistan. Transactions of the Canadian Society for Mechanical Engineering, 46(2), 412–426. DOI: 10.1139/tcsme-2021-0134

18. Siddiqui, M., **Yousuf, M. U.**, Rashid, M. K., & Ahmed, A. (2022). Probabilistic Assessment of Exergy Analysis of a Wind Turbine for Optimum Performance. Transactions of the Canadian Society for Mechanical Engineering, 46 (2), 285–294. DOI: 10.1139/tcsme-2021-0122

19. Uzair, M., Rehman. N, & **Yousuf, M. U.** (2022). Sensitivity Analysis of Capital and Energy Production Cost for Off-Grid Building Integrated Photovoltaic Systems. Renewable Energy, 186, 195-206. DOI: 10.1016/j.renene.2022.01.003

20. **Yousuf, M. U.**, Al-Bahadly, I., & Avci, E. (2022). Wind Speed Prediction for Small Sample Dataset Using Hybrid First-Order Accumulated Generating Operation Based Double Exponential Smoothing Model. Energy Science and Engineering, 10(3), 726-739. DOI: [10.1002/ese3.1047](10.1002/ese3.1047)

21. **Yousuf, M. U.**, Umair, M., & Uzair, M. (2022). Estimating the average diffuse solar radiation based on

multiple parameters: a case study of arid climate zone of Pakistan. International Journal of Ambient Energy, 43(1), 1615-1625. DOI: [10.1080/01430750.2020.1712244](10.1080/01430750.2020.1712244)

22. **Yousuf, M. U.**, Al-Bahadly, I., & Avci, E. (2021). Short-term wind speed forecasting based on hybrid MODWT-ARIMA-Markov model. IEEE Access, DOI: 10.1109/ACCESS.2021.3084536

23. **Yousuf, M. U.**, Al-Bahadly, I., & Avci, E. (2021). A modified GM (1, 1) model to accurately predict wind speed. Sustainable Energy Technologies and Assessments, 43, 100905. DOI: 10.1016/j.seta.2020.100905

24. **Yousuf, M. U.**, & Shere, S. M. (2020). A novel computational methodology to estimate solar energy on building rooftops. Environmental Progress & Sustainable Energy, 39(4), e13385. DOI: [10.1002/ep.13385](10.1002/ep.13385)

25. **Yousuf, M. U.**, Al-Bahadly, I., & Avci, E. (2019). Current perspective on the accuracy of deterministic wind speed and power forecasting. IEEE Access, 7, 159547-159564. DOI: 10.1109/ACCESS.2019.2951153

26. **Yousuf, M. U.**, & Umair, M. (2018). Development of diffuse solar radiation models using measured data. International Journal of Green Energy, 15(11), 651-662. DOI: [10.1080/15435075.2018.1525738](10.1080/15435075.2018.1525738)

27. **Yousuf, M. U.**, Siddiqui, M., & Rehman, N. U. (2018). Solar energy potential estimation by calculating sun illumination hours and sky view factor on building rooftops using digital elevation model. Journal of Renewable and Sustainable Energy, 10(1), 013703. DOI: [10.1063/1.4997888](10.1063/1.4997888)

Conference Proceedings/Symposiums/Seminars

1. **Yousuf, M. U.** (2022, January). Why do we need improved wind speed forecasting models for small sample datasets? In 11th International Mechanical Engineering Conference. Karachi.

2. **Yousuf, M. U.** (2019, August). Deterministic models for wind energy forecasting. In IEEE Postgraduate Symposium. Massey University, Palmerston North, New Zealand.

3. **Yousuf, M. U.**, Umair, M., & Khan, S. T. (2018, December). Optimum Tilt Angles for Energy Policy Making of a City - Case Study of Karachi. In Proceedings of 1st International Conference on Carbon Neutral Built Environment. Karachi.

4. **Yousuf, M. U.**, Uddin, M., Azhar, M. A. B., Hashmi, Y., & Ibtihaj, M. (2017, March). Statistical Analysis of Empirical Sky Models for Energy Policy Making of Karachi. In Proceedings of 7th International Mechanical Engineering Conference (pp. 33-38). Karachi.

COMMUNITY SERVICE AND OTHER ACTIVITIES

➢ **Vice President**, Massey Muslim Society, Palmerston North, New Zealand (2021-2022)
➢ **Member**, sub-committee, Manawatu Muslim Association, Palmerston North, New Zealand (2021-2022)
➢ **Member**, sub-committee, DEA Trust, Karachi, Pakistan (2016-to date)
➢ Stories and articles published in local magazines
➢ Secured positions in extracurricular activities (quiz, debates, speeches, essay writings and science exhibitions) organized by different institutions including NED University, Pakistan Quiz Society (PQS), Hum TV (Special Ramadan Transmission), KASBIT, and CDGK